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PATENT CLAIMS

1. A fiber optic current sensor having a coiled sensor fiber (1) which encloses a current conductor (S), and at least one phase delay element (4, 5) adjoining the sensor fiber (1), characterized in that the at least one phase delay element (4, 5) has a phase delay with a temperature dependence which at least approximately compensates for a temperature dependence of a Verdet's constant (V) of the sensor fiber (1).

- 2. The current sensor as claimed in claim 1, characterized in that the at least one phase delay element (4, 5) has a phase delay angle whose value deviates from a phase delay angle of an ideal phase delay element.
- 3. The current sensor as claimed in one of claims 1 or 2, characterized in that the at least one phase delay element (4, 5) is a $\lambda/4$ fiber segment with an elliptical core, and in that the $\lambda/4$ fiber segment has a length (L) which deviates from a quarter or an odd multiple of a quarter of a beat length of orthogonal polarization modes.
- 4. The current sensor as claimed in claim 2, characterized in that the magnitude of the phase delay angle is selected as a function of a mutual alignment of fast axes of the phase delay element (4, 5).
- 5. The current sensor as claimed in claim 2, characterized in that the magnitude of the phase delay angle is selected as a function of a sign of the temperature dependence of the at least one phase delay element (4, 5).
- 6. The current sensor as claimed in claims 2, 4 and 5, characterized in that there are at least two phase delay elements (4, 5), each having a fast axis, the fast axes being orientated at least approximately parallel to one another, and in that in the case of a temperature dependence of the phase delay elements (4, 5) of positive sign the phase delay angle is greater, and in the case of a temperature dependence of negative

sign it is smaller than a phase delay angle of an ideal phase delay element.

- The current sensor as claimed in claims 2, 4 and 5, characterized in that there are at least two phase delay elements (4, 5) each having a fast axis, the fast axes being orientated at least approximately orthogonally to one another, and in that in the case of a temperature dependence of the phase delay elements (4, 5) of positive sign the phase delay angle is smaller, and in the case of a temperature dependence of negative sign it is larger than a phase delay angle of an ideal phase delay element.
- The current sensor as claimed in claim 1, characterized in that it has a Sagnac interferometer.
- 9. The current sensor as claimed in claim 1, characterized that it reflection has а interferometer

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